1904MNRAS..64..421D

Values of various Arguments in the middle of the 44th period of analysis and their movements in 400 lunar days or one period of analysis.

Argument. Calendar	Value. 1800 Jan. 3d·6 G.M.T.	Movement. 414·02 Solar Days.
g	159°·7658	5409°·1681
g'	4·1375	408·0583
ω	192·7447	68·0478
ω'	246·4312	21·9435
☊	33·0749	−21·9241
D	101·9418	5047·2141
$g-\mathrm{D}$	57·8240	361·9540
$\varpi=\omega+$ ☊	225·8196	46·1237
$\varpi'=\omega'+$ ☊	279·5061	0·0194
$\varpi-\varpi'=\omega-\omega'$	306·3135	46·1043
Venus V	151·2198	663·3141
Earth E	103·6435	408·0619
Mars M	234·5551	216·9601
Jupiter J	82·1455	34·4014
$2\varpi-2\mathrm{J}$	287·3482	23·4445
$2\varpi-3\mathrm{J}+7^\circ$	212·2027	−10·9570
$2\varpi+3\mathrm{V}-5\mathrm{E}$	27·0811	41·8802
A + 30°	213·8946	1·4953
8V − 13E + 274° 14′	136·6262	1·7081

Comparisons of the Geocentric Places of the Sun and Major Planets calculated from the Tables of the American Ephemeris Office, with their Places calculated from Le Verrier's Tables, for the year 1906. By A. M. W. Downing, D.Sc., F.R.S.

This paper is supplementary to those published in *Monthly Notices*, vol. lix. No. 10, and vol. lxii. No. 1.

The American Tables of the Sun, *Mercury*, *Venus*, *Mars*, *Uranus*, and *Neptune* are due to Professor Newcomb; those of *Jupiter* and *Saturn* to Mr. G. W. Hill. These Tables are adopted in calculating the ephemerides given in the *Nautical Almanac* for 1906. The corresponding places in the *Connaissance des Temps* for the same year are from Le Verrier's Tables.

The comparisons have been made by reducing the quantities given in the *Nautical Almanac* from Greenwich noon to Paris noon at convenient intervals throughout the year, and then finding the differences between the reduced quantities and the

1904MNRAS..64..421D

corresponding quantities in the *Connaissance des Temps*. For the right ascensions the discordances are given in arc of a great circle, as well as in time, to render them comparable with the discordances in declination.

The abnormal discordances in the case of *Venus*, near the time of inferior conjunction with the Sun in 1906, are noteworthy as appearing to show that the ordinary methods of computation are not sufficiently refined to ensure accuracy in the geocentric places corresponding to these critical positions of the planet in its orbit.

With regard to *Saturn* it will be remembered that M. Gaillot has succeeded in rectifying Le Verrier's theory of this planet, which has been found to be defective in certain particulars. The publication of the corresponding corrections to the Tables will be awaited with interest.

SUN, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A. Time.	R.A. Arc.	Decl.	Day. 1906.	R.A. Time.	R.A. Arc.	Decl.
	s	″	″		s	″	″
Jan. 2	−·07	−1·0	−0·4	July 5	−·01	−0·1	+0·3
10	−·06	−0·8	−0·3	13	·00	0·0	+0·2
18	−·04	−0·6	−0·4	21	−·03	−0·4	+0·2
26	−·04	−0·6	−0·4	29	−·03	−0·4	+0·4
Feb. 3	−·04	−0·6	−0·4	Aug. 6	−·03	−0·4	+0·3
11	−·03	−0·4	−0·3	14	−·03	−0·4	+0·2
19	−·01	−0·2	−0·2	22	−·04	−0·6	+0·3
27	−·02	−0·3	−0·3	30	−·04	−0·6	+0·3
Mar. 7	−·01	−0·2	−0·2	Sept. 7	−·04	−0·6	+0·1
15	−·01	−0·2	−0·1	15	−·05	−0·8	+0·2
23	·00	0·0	−0·1	23	−·06	−0·9	+0·2
31	−·01	−0·2	0·0	Oct. 1	−·06	−0·9	+0·2
Apr. 8	+·01	+0·2	0·0	9	−·06	−0·9	+0·1
16	+·01	+0·2	+0·2	17	−·07	−1·0	+0·2
24	·00	0·0	+0·1	25	−·08	−1·2	+0·2
May 2	·00	0·0	+0·2	Nov. 2	−·07	−1·0	+0·2
10	−·01	−0·1	+0·1	10	−·06	−0·9	+0·1
18	·00	0·0	+0·3	18	−·09	−1·3	+0·1
26	−·01	−0·1	+0·1	26	−·08	−1·1	−0·1
June 3	−·01	−0·1	+0·2	Dec. 4	−·06	−0·8	−0·1
11	+·01	+0·1	+0·2	12	−·06	−0·8	−0·1
19	·00	0·0	+0·1	20	−·06	−0·8	−0·3
27	−·02	−0·3	+0·2	28	−·06	−0·8	−0·2

1904MNRAS..64..421D

MERCURY, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A. Time.	R.A. Arc.	Decl.	Day. 1906.	R.A. Time.	R.A. Arc.	Decl.
	s	″	″		s	″	″
Jan. 2	−·03	−0·4	−0·4	July 5	−·06	−0·9	+0·5
10	+·01	+0·1	−0·3	13	−·05	−0·7	+0·5
18	+·02	+0·3	0·0	21	−·07	−1·0	+0·6
26	+·03	+0·4	−0·1	29	−·12	−1·8	+0·7
Feb. 3	+·03	+0·4	0·0	Aug. 6	−·12	−1·8	+1·1
11	+·03	+0·4	+0·2	14	−·11	−1·6	+0·4
19	·00	0·0	0·0	22	−·05	−0·7	+0·3
27	−·02	−0·3	−0·4	30	−·05	−0·7	−0·1
Mar. 7	−·04	−0·6	−0·5	Sept. 7	−·07	−1·0	+0·1
15	−·01	−0·2	−0·5	15	−·04	−0·6	+0·1
23	·00	0·0	−0·4	23	−·05	−0·8	0·0
31	−·03	−0·4	−0·3	Oct. 1	−·01	−0·2	0·0
Apr. 8	−·04	−0·6	−0·2	9	·00	0·0	−0·1
16	−·05	−0·9	−0·1	17	·00	0·0	−0·1
24	−·06	−0·9	0·0	25	·00	0·0	−0·1
May 2	−·05	−0·8	+0·3	Nov. 2	·00	0·0	−0·3
10	−·02	−0·3	+0·2	10	−·01	−0·1	−0·3
18	−·03	−0·4	+0·1	18	−·01	−0·1	−0·5
26	−·06	−0·9	−0·2	26	+·03	+0·4	−0·6
June 3	−·09	−1·3	−0·3	Dec. 4	+·08	+1·1	−1·1
11	−·05	−0·7	−0·2	12	+·03	+0·4	−0·3
19	−·07	−1·0	0·0	20	+·02	+0·3	−0·2
27	−·07	−1·0	+0·4	28	−·01	−0·1	−0·1

NOTE.—*Mercury* is in inferior conjunction with the Sun, 1906 November 29^{d} 18^{h}.

VENUS, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A. Time.	R.A. Arc.	Decl.	Day. 1906.	R.A. Time.	R.A. Arc.	Decl.
	s	″	″		s	″	″
Jan. 2	−·01	−0·1	−1·2	Apr. 8	−·16	−2·4	+0·1
10	+·01	+0·1	−1·1	16	−·16	−2·3	+0·3
18	+·01	+0·1	−1·0	24	−·18	−2·6	+0·3
26	−·02	−0·3	−0·9	May 2	−·17	−2·4	+0·5
Feb. 3	−·03	−0·4	−0·8	10	−·17	−2·4	+0·5
11	−·05	−0·7	−0·9	18	−·14	−1·9	+0·7
19	−·05	−0·7	−0·6	26	−·15	−2·1	+0·8
27	−·08	−1·2	−0·6	June 3	−·14	−1·9	+0·6
Mar. 7	−·10	−1·5	−0·3	11	−·12	−1·6	+0·5
15	−·11	−1·7	−0·4	19	−·11	−1·5	+0·5
23	−·13	−2·0	−0·3	27	−·08	−1·1	+0·3
31	−·15	−2·2	−0·2	July 5	−·09	−1·3	−0·1

1904MNRAS..64..421D

Day. 1906.	R.A.		Decl.	Day. 1906.	R.A.		Decl.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
July 13	−·07	− 1·0	−0·3	Oct. 9	+·10	+ 1·4	−0·6
21	−·07	− 1·0	−0·6	17	+·17	+ 2·3	−0·2
29	−·07	− 1·0	−0·8	25	+·27	+ 3·6	+0·7
Aug. 6	−·07	− 1·1	−1·3	Nov. 2	+·32	+ 4·2	+1·2
14	−·06	− 0·9	−1·3	10	+·48	+ 6·4	+2·4
22	−·06	− 0·9	−1·6	18	+·59	+ 8·0	+2·7
30	−·05	− 0·7	−1·5	26	+·69	+ 9·4	+2·8
Sept. 7	−·03	− 0·4	−1·7	Dec. 4	+·72	+10·0	+2·8
15	−·01	− 0·1	−1·6	12	+·62	+ 8·8	+2·6
23	−·01	− 0·1	−1·3	20	+·43	+ 6·2	+2·4
Oct. 1	+·04	+ 0·6	−1·0	28	+·29	+ 4·2	+2·3

NOTE.—*Venus* is in inferior conjunction with the Sun, 1906 November 29^{d} 17^{h}.

MARS, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A.		Decl.	Day. 1906.	R.A.		Decl.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
Jan. 2	−·03	−0·4	−0·3	July 5	−·11	−1·5	+0·6
10	−·04	−0·6	−0·4	13	−·10	−1·4	+0·6
18	−·03	−0·5	−0·2	21	−·11	−1·5	+0·7
26	−·04	−0·6	−0·3	29	−·10	−1·4	+0·7
Feb. 3	−·04	−0·6	−0·3	Aug. 6	−·09	−1·3	+0·9
11	−·05	−0·8	−0·2	14	−·09	−1·3	+0·8
19	−·04	−0·6	−0·3	22	−·09	−1·3	+0·8
27	−·06	−0·9	−0·3	30	−·08	−1·2	+0·7
Mar. 7	−·06	−0·9	−0·3	Sept. 7	−·08	−1·2	+0·6
15	−·07	−1·0	−0·2	15	−·06	−0·9	+0·7
23	−·07	−1·0	−0·1	23	−·07	−1·0	+0·7
31	−·08	−1·2	−0·2	Oct. 1	−·07	−1·0	+0·7
Apr. 8	−·09	−1·3	−0·1	9	−·07	−1·0	+0·4
16	−·07	−1·0	+0·1	17	−·08	−1·2	+0·6
24	−·08	−1·1	0·0	25	−·07	−1·1	+0·5
May 2	−·09	−1·3	+0·1	Nov. 2	−·06	−0·9	+0·4
10	−·10	−1·4	+0·2	10	−·06	−0·9	+0·5
18	−·09	−1·2	+0·2	18	−·07	−1·1	+0·5
26	−·10	−1·4	+0·3	26	−·06	−0·9	+0·3
June 3	−·10	−1·4	+0·3	Dec. 4	−·06	−0·9	+0·3
11	−·09	−1·2	+0·4	12	−·05	−0·7	+0·4
19	−·10	−1·4	+0·6	20	−·04	−0·6	+0·1
27	−·11	−1·5	+0·6	28	−·06	−0·9	+0·2

1904MNRAS..64..421D

JUPITER, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A.		Decl.
	Time.	Arc.	
	s	″	″
Jan. 2	+·10	+1·4	+0·5
10	+·09	+1·3	+0·4
18	+·09	+1·3	+0·5
26	+·07	+1·0	+0·2
Feb. 3	+·07	+1·0	+0·3
11	+·08	+1·1	+0·3
19	+·06	+0·9	+0·4
27	+·09	+1·3	+0·3
Mar. 7	+·08	+1·1	+0·4
15	+·05	+0·7	+0·4
23	+·06	+0·9	+0·3
31	+·04	+0·6	+0·2
Apr. 8	+·05	+0·7	+0·4
16	+·04	+0·6	+0·3
24	+·03	+0·4	+0·3
May 2	+·02	+0·3	+0·3
10	+·02	+0·3	+0·4
18	+·01	+0·1	+0·3
26	+·02	+0·3	+0·3
June 3	·00	0·0	+0·3
11	+·01	+0·1	+0·2
19	+·01	+0·1	+0·2
27	+·01	+0·1	+0·5
July 5	·00	0·0	+0·3
13	+·01	+0·1	+0·3
21	−·01	−0·1	+0·3
29	−·03	−0·4	+0·5
Aug. 6	−·01	−0·1	+0·3
14	−·02	−0·3	+0·3
22	−·03	−0·4	+0·1
30	·00	0·0	+0·2
Sept. 7	−·04	−0·6	+0·2
15	−·02	−0·3	+0·3
23	−·02	−0·3	+0·2
Oct. 1	·00	0·0	+0·2
9	−·01	−0·1	+0·3
17	−·02	−0·3	+0·3
25	−·02	−0·3	+0·4
Nov. 2	−·02	−0·3	+0·4
10	−·03	−0·4	+0·6
18	−·02	−0·3	+0·5
26	−·01	−0·1	+0·4
Dec. 4	−·03	−0·4	+0·7
12	−·03	−0·4	+0·4
20	−·03	−0·4	+0·6
28	−·04	−0·6	+0·5

SATURN, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A.		Decl.
	Time.	Arc.	
	s	″	″
Jan. 2	−·42	−6·1	−2·3
10	−·42	−6·2	−2·1
18	−·42	−6·2	−2·3
26	−·42	−6·2	−2·4
Feb. 3	−·43	−6·3	−2·4
11	−·44	−6·5	−2·3
19	−·44	−6·5	−2·5
27	−·46	−6·8	−2·5
Mar. 7	−·47	−6·9	−2·7
15	−·46	−6·8	−2·7
23	−·48	−7·1	−2·8
Mar. 31	−·48	−7·1	−2·8
Apr. 8	−·48	−7·1	−2·9
16	−·49	−7·3	−3·0
24	−·52	−7·7	−3·0
May 2	−·52	−7·7	−3·1
10	−·53	−7·9	−3·1
18	−·55	−8·2	−3·3
26	−·55	−8·2	−3·3
June 3	−·57	−8·5	−3·5
11	−·58	−8·6	−3·5
19	−·60	−8·9	−3·6

1904MNRAS..64..421D

Day. 1906.	R.A.		Decl.	Day. 1906.	R.A.		Decl.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
June 27	−·62	−9·2	−3·8	Oct. 1	−·68	−10·0	−4·0
July 5	−·62	−9·2	−3·9	9	−·68	−10·0	−4·1
13	−·63	−9·4	−4·0	17	−·68	−10·0	−4·0
21	−·66	−9·8	−4·0	25	−·67	−9·9	−4·0
29	−·65	−9·7	−3·9	Nov. 2	−·67	−9·9	−3·9
Aug. 6	−·67	−10·0	−4·1	10	−·66	−9·7	−3·9
14	−·67	−10·0	−4·0	18	−·65	−9·6	−3·9
22	−·70	−10·4	−4·1	26	−·66	−9·7	−3·9
30	−·68	−10·1	−4·0	Dec. 4	−·65	−9·7	−3·9
Sept. 7	−·68	−10·1	−3·9	12	−·65	−9·6	−3·8
15	−·68	−10·1	−3·9	20	−·64	−9·5	−3·9
23	−·68	−10·1	−4·0	28	−·65	−9·6	−3·9

URANUS, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A.		Decl.	Day. 1906.	R.A.		Decl.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
Jan. 1	−·31	−4·3	−0·3	July 4	−·35	−4·8	−0·1
Feb. 2	−·32	−4·4	−0·3	Aug. 1	−·33	−4·6	−0·1
Mar. 2	−·33	−4·6	−0·2	Sept. 2	−·31	−4·3	−0·2
Apr. 3	−·34	−4·7	−0·2	Oct. 4	−·31	−4·3	−0·1
May 1	−·34	−4·7	−0·1	Nov. 1	−·29	−4·0	−0·1
June 2	−·35	−4·8	−0·2	Dec. 3	−·30	−4·1	−0·2

NEPTUNE, 1906.—*Corrections to Le Verrier's Tables.*

Day. 1906.	R.A.		Decl.	Day. 1906.	R.A.		Decl.
	Time.	Arc.			Time.	Arc.	
	s	″	″		s	″	″
Jan. 1	−·45	−6·3	−1·9	July 4	−·43	−6·0	−1·6
Feb. 2	−·45	−6·3	−1·9	Aug. 1	−·44	−6·1	−1·7
Mar. 2	−·44	−6·1	−1·9	Sept. 2	−·44	−6·1	−1·7
Apr. 3	−·44	−6·1	−2·1	Oct. 4	−·45	−6·3	−1·8
May 1	−·45	−6·3	−2·0	Nov. 1	−·46	−6·4	−1·6
June 2	−·44	−6·1	−1·9	Dec. 3	−·48	−6·7	−1·6

H.M. Nautical Almanac Office:
1904 *February* 29.

1904MNRAS..64..421D

Note on the Drawings of the Mare Serenitatis by John Russell, R.A. By S. A. Saunder, M.A.

On pp. 156–159 of the present volume of the *Monthly Notices* Dr. Rambaut gives an account of two drawings of the region around Linné made by Mr. John Russell, R.A., and arrives at the conclusion that they render it probable that Linné then presented much the same appearance as at the present day when viewed with a low-power eyepiece attached to a small telescope.

The drawing reproduced in plate 3, fig. 2, has not much direct bearing on the question of change, for we are told by Mädler that near the time of full moon Linné was seen in his time as here represented, namely, as a round white spot almost as white in the middle as at the edges. It is to the drawing in fig. 1 that the real interest attaches. My own introduction to this drawing was through a photograph shown me by Dr. Rambaut, and from an inspection of this I came to the conclusion that it did offer distinct evidence of a change. As I was afterwards led to modify this opinion when, by the kindness of Dr. Rambaut, I was allowed to inspect the original, it may be not without interest that I should put on record both my first impression and the reasons which led me to modify it, as many will see the reproduction and but few can hope to have the opportunity of comparing it with the original.

Referring to plate 3, fig. 1, the only genuine marks on the floor besides Bessel and the bright streaks are :

(1) A small dark spot 0·45 in. from Bessel at position-angle 311°. This is perhaps a little more conspicuous in the original, but not much so. It almost certainly denotes Bessel A.

(2) A somewhat larger dark mark 0·61 in. from Bessel at position-angle 352°. This is much more conspicuous in the original, but careful inspection shows that it is due to a stain and is not part of Russell's drawing.

(3) The large dark mark 0·85 in. from Bessel at position-angle 70°. This is referred to by Dr. Rambaut in his note on p. 157, and, like the last, is a stain on the paper.

(4) Linné, 1·37 in. from Bessel, at position-angle 53°. This, as stated by Dr. Rambaut, is whiter and more conspicuous in the original, where also the dark curved shading to the west of the white spot is clearly seen and has every appearance of being intentional. The large dark mark trending to the south-east of the white spot has its importance exaggerated in the reproduction, where it looks decidedly like a shadow, and I was led to hope that some estimate might be formed of the height of the mountain to which it was due ; but from its faintness in the original, coupled with its southerly direc-